

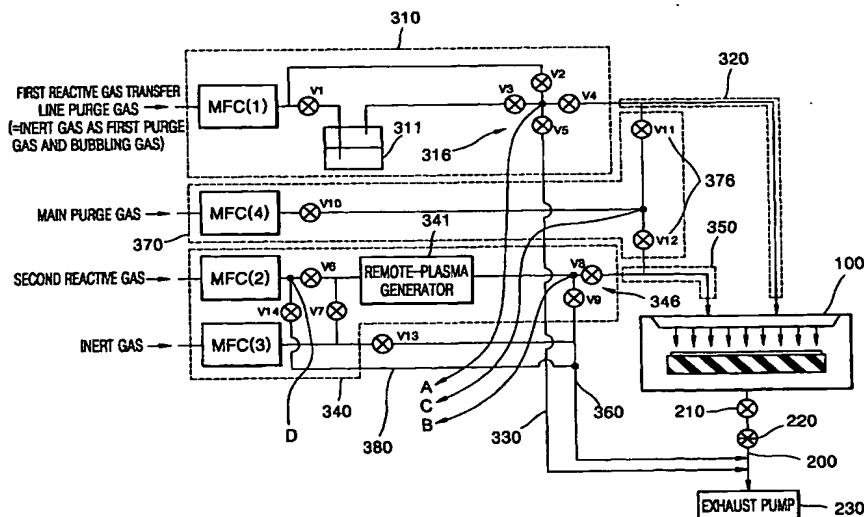
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WO 03/089683 A1(51) International Patent Classification⁷: **C23C 16/455****BAE, Jang-Ho [KR/KR]; IPS Ltd., 33, Jije-dong, Pyungtaek-city, Kyungki-do 450-090 (KR).**(21) International Application Number: **PCT/KR03/00786**(74) Agent: **LEE, Young-Pil; The Cheonghwa Building, 1571-18, Seocho-dong, Seocho-gu, Seoul 137-874 (KR).**(22) International Filing Date: **17 April 2003 (17.04.2003)**(25) Filing Language: **English**(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.(26) Publication Language: **English**(30) Priority Data:
10-2002-0021554 19 April 2002 (19.04.2002) **KR**(71) Applicant (*for all designated States except US*): **IPS LTD. [KR/KR]; 33 Jije-dong, Pyungtaek-city, Kyungki-do 450-090 (KR).**(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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(57) Abstract: A remote-plasma ALD apparatus includes a reaction chamber, an exhaust line for exhausting gas from the reaction chamber, a first reactive gas supply unit for selectively supplying a first reactive gas to the reactant chamber or the exhaust line, a first reactive gas transfer line for connecting the first reactive gas supply unit and the reactant chamber, a first bypass line for connecting the first reactive gas supply line and the exhaust line, a radical supply unit for generating radicals and selectively supplying the radicals to the reactant chamber or the exhaust line, a radical transfer line for connecting the radical supply unit and the reactant chamber, a second bypass line for connecting the radical supply unit and the exhaust line, and a main purge gas supply unit for supplying a main purge gas to the first reactant transfer line and/or the radical transfer line.